IKONOS Stereo Mapping Block Adjustment Test

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IKONOS Stereo Mapping
Block Adjustment Test

OBJECTIVES

- Evaluate Sensor Accuracy
  - Rigorous math model
  - Polynomial math model with adjustable parameters
    - Space Imaging addition to RPC format
- Influence of Ground Control
- Influence of Multiple Strips in Block Adjustment
- Evaluate Covariance Support Data
  - Predicted errors versus actual errors
  - Adjustable RPC vs Rigorous

Impressive Aspects of the High Resolution Sensors

- High Resolution
- Simultaneous Optical and MSI Collection
- Multiple N-S Stereo Strips within Image Block
- Selective Availability Turned Off !
- Smooth Push-broom Motion of Satellite
  - Supported by Gyros and Star Sensors

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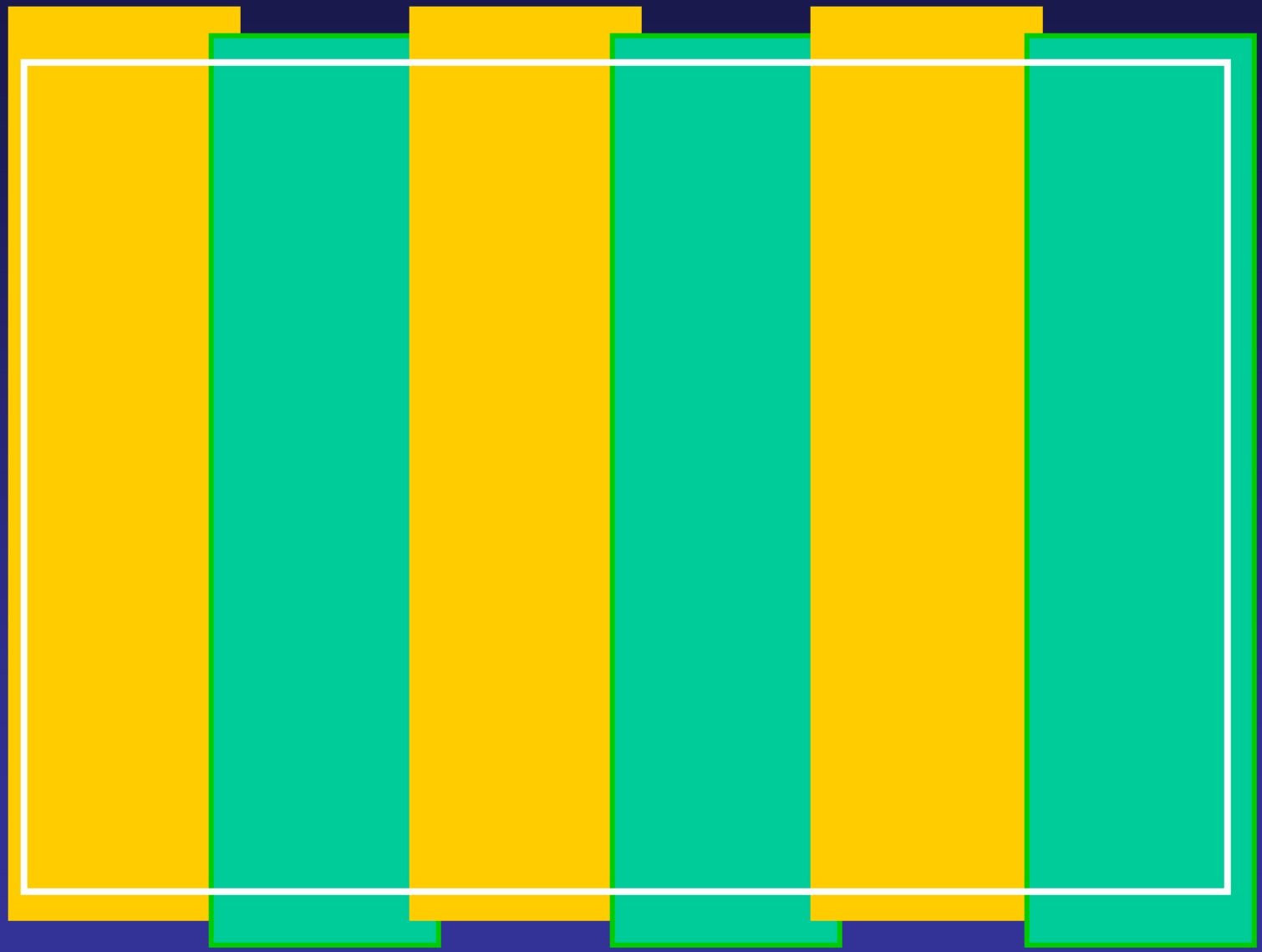

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How accurate are these sensors ?

Is control needed to support medium-scale mapping ?

How much control is needed to support targeting ?

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TEST OUTLINE

- Unadjusted Stereo Pairs
  - Evaluate against control
- Multiple Strips with Ground control
  - Sequential adjustment of strips
  - 1, 1-2, 1-2-3, 1-2-3-4, etc for all 6
- Full Block with Ground Control
  - One GCP near center
  - Several GCPs
  - Multiple GCPs
- All of these include Rigorous vs RPC comparisons

Test Areas

- Namibia, Africa
  - Total area: 5,971 km^2
  - Longitude Extent: 16.57 E - 17.22 E
  - Latitude Extent: 22.29 S - 23.22 S
  - Six overlapping strips
- Nellis AFB, Nevada
  - Total area: 929 km2
  - Longitude Extent: 115.00 W - 115.67 W
  - Latitude Extent: 36.21 N - 36.35 N
  - Six overlapping strips
- Using existing SI data in Namibia
- NIMA CIP purchasing Nellis imagery

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TEST LOGISTICS

- All work to be performed at Thornton facility
  - NIMA, USGS and Space Imaging
- Space Imaging manages rigorous adjustment
- Government will perform 'modified RPC' adjustment
  - SocetSet application available at Thornton
  - Related work underway for tactical sensors
- Government generating control data for Namibia
- Government will manage statistical analysis

IKONOS Stereo Mapping Block Adjustment Test

TEST STATUS

- Preliminary Discussions at Thornton last Fall
- Namibia imagery available
- Nellis nearly completed collection
- Control generation for Namibia underway
- Funding provided to Space Imaging
- Kick-Off discussion Today!!